

What is Claimed is:

1. A blind rivet comprising

- 5           a. a tubular shell;
- b. a mandrel extending through the shell;
- c. the shell has an outwardly extending flange at one end forming a rivet head, and  
10           having a first set of radial indentations arranged around the periphery of the shell at  
              a first distance from the rivet head, and a second set of radial indentations arranged  
              around the periphery of the shell at a second distance from the rivet head, the radial  
              indentations having been formed by crimping into the rivet shell after it is positioned  
              around the mandrel; the end of the shell that is remote from the rivet head being  
              the blind end of the rivet shell; and
- d. the mandrel having a head at one end which abuts against the blind end of the shell,  
              and a stem extending from the head, the stem having a point of weakness part way  
              along its length, and disposed within the shell.

20           2. The combination claimed in Claim 1 wherein:

- a. a third set of indentations arranged around the periphery of the shell at a third  
              distance from the rivet head.

25           3. The combination claimed in Claim 2 wherein:

- a. the hardness of the rivet shell in the region of each of the indentations is between  
              20% to 30% higher than the hardness of the rivet shell at a point mid way between  
30           adjacent longitudinally spaced indentations.

4. The combination claimed in Claim 3 wherein:
- a. the depth of at least one of the sets of the indentations, prior to the rivet setting process, is at least 0.20mm.
- 5
5. The combination claimed in Claim 4 wherein:
- a. the depth of at least one of the sets of the indentations, prior to the rivet setting process, is at least 20to 25% of the thickness of the shell.
- 10
6. The combination claimed in Claim 5 wherein:
- a. each set of radial indentations having between two to eight indentations.
- 15
7. The combination claimed in Claim 6 wherein:
- a. the longitudinal spacing between adjacent sets of indentations is at least 2mm.
- 20
8. The combination claimed in Claim 7 wherein:
- a. the radial indentations are circular with outwardly sloping edges.
- 25
9. The combination claimed in Claim 8 wherein:
- a. the first and second set of indentations in the shell are respectively nearer to, and further from, the shell flange, than the point of weakness of the mandrel is to the shell flange.

10. A method of securing at least two workpiece components together using a blind rivet comprising the steps of:
- 5           a. positioning the blind rivet such that the mandrel of the blind rivet extends through substantially aligned apertures in the workpiece components; and
- 10           b. moving the mandrel axially relative to the shell such that the head of the mandrel abuts against the blind end of the shell, thereby causing the portions of the shell between the indentations to expand radially, and the radial indentations in the shell to collapse, whereby the workpiece components are held together and the apertures in the workpiece components are substantially filled.
11. The method claimed in Claim 10 comprising the additional step of:
- 15           a. using a soft material of predetermined density for at least one of the workpiece components.
12. The method claimed in Claim 10 comprising the additional step of:
- 20           a. Using a friable material of predetermined density for at least one of the workpiece components.
13. The combination claimed in Claim 9 wherein:
- 25           a. an aperture formed in each of the workpiece components; and
- b. the apertures aligned with each other.
14. The combination claimed in Claim 13 wherein:
- 30           a. one of the workpiece components is formed of a soft material of predetermined density.

15. The combination claimed in Claim 13 wherein:

- 5           a. at least one of the workpiece components is formed of a friable material of  
predetermined density.

Mitsubishi Electric Intellectual Property Protection System